Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer; Report and Publication Writing

Project Number:	01159
Restoration Category:	Monitoring
Proposer:	Migratory Bird Management, U. S. Fish and Wildlife Service
Lead Trustee Agency:	U. S. Department of the Interior, Fish and Wildlife Service
Cooperating Agencies:	None
Alaska SeaLife Center:	No
Duration:	7 years of surveys completed from1989 to 2000, plan to continue until recovery occurs or until GEM takes over
Cost FY 01:	$35,700 report and publication writing
Cost FY 02:	$~251,000 surveys
Cost FY 03:	$~50,000 report and publication writing
Geographic Area:	Prince William Sound
Injured Resource/Service:	All marine birds and sea otters

ABSTRACT

We conducted small boat surveys to monitor abundance of marine birds in Prince William Sound, Alaska during March 1990, 1991, 1993, 1994, 1996, 1998 and 2000 and July 1989, 1990, 1991, 1993, 1996, 1998, and 2000. We will use the data to examine trends by determining whether populations in the oiled zone changed at the same rate as those in the unoiled zone. We will also examine overall population trends for Prince William Sound from 1989-98. We will prepare an annual report and to complete the publication of a paper that has been started in previous years.

INTRODUCTION

The waters and shorelines of Prince William Sound support abundant marine bird and sea otter (***Enhydra lutris***) populations throughout the year (Isleib and Kessel 1973, Hogan and Murk 1982, Irons et al. 1988a). Potential injuries to marine birds from exposure to the ***T/V Exxon Valdez*** oil spill included, but were not limited to death, changes in behavior, and decreased productivity. U. S. Fish and Wildlife Service, Migratory Bird Management conducted boat surveys in Prince William Sound prior to the ***Exxon Valdez*** oil spill in 1972-73 (Dwyer et al. 1976) and 1984-85 (Irons et al. 1988a,b). After the oil spill, Natural Resource Damage Assessment Bird Study Number 2 (Burn 1994, Klosiewski and Laing 1994) was initiated to document damage from the oil spill on the marine bird and sea otter populations of Prince William Sound. Data from these surveys indicated that populations of sea otters (Burn 1994) and several marine bird species (Klosiewski and Laing 1994) declined in the oil spill area. Thus, restoration projects 93045 (Agler et al. 1994c), 94159 (Agler et al. 1995a), 96159 (Agler and Kendall 1997), and 98159 (Lance et al. 1999) were initiated to continue monitoring marine bird and sea otter population abundance to assess recovery of injured species. Restoration projects 93045, 94159, 96159, and 98159 continued the original ***Exxon Valdez*** oil spill damage assessment study (Bird Study Number 2, Burn 1994, Klosiewski and Laing 1994) from 1989-91.

Surveys will be conducted in March and July of 2000. Based on conclusions from a power analysis (Agler 1995), we have proposed conducting the surveys every other year, until restoration has occurred. We will use data collected in 2000 to monitor the distribution and abundance of marine birds and sea otters in Prince William Sound. These data will be combined with data collected in 1989-91 (Klosiewski and Laing 1994), 1993 (Agler et al. 1994c), 1994 (Agler et al. 1995a),1996 (Agler and Kendall 1997) and 1998 (Lance et al. 1999) to examine trends in marine bird and sea otter distribution and abundance. This project will benefit restoration of Prince William Sound by determining whether populations that declined due to the spill are recovering and by identifying what species are still of concern.

Funding this year will provide the opportunity to complete an annual report from the 2000 surveys and to revise a paper that has been submitted for publication. We have already written four reports (Agler et al. 1994c, 1995a; Agler and Kendall 1997, Lance et al. 1999) and presented papers on Prince William Sound at scientific meetings. With no field work scheduled for 2001 we plan to use the time to complete the annual report and revise the paper submitted for publication.

NEED FOR THE PROJECT

A. Statement of the Problem

Almost 30,000 marine bird (Piatt et al. 1990) and 900 sea otter (DeGange and Lensink 1990) carcasses were recovered following the ***Exxon Valdez*** oil spill. Based on modeling studies using carcass search effort and population data, an estimated 300,000 - 645,000 marine birds were killed in Prince William Sound and the northern Gulf of Alaska (Ecological Consulting, Inc. 1991). Garrott et al. (1993) estimated that 2,800 sea otters were killed. These estimates were probably low, because they only included direct mortality occurring in the first five months after the spill.

The U. S. Fish and Wildlife Service conducted boat surveys of marine bird and sea otter populations in Prince William Sound in 1972-73 (Dwyer et al. 1976), 1984-85 (Irons et al. 1988a,b), and several years following the spill (1989, 1990, 1991, Klosiewski and Laing 1994; 1993, Agler et al. 1994c; 1994, Agler et al., 1995a; and 1996, Agler and Kendall 1997, Lance et al. 1999). Additional surveys will be conducted in winter and summer of 2000. Klosiewski and Laing (1994) documented overall declines in 15 species or species groups between 1972-73 (Dwyer et al. 1976) and the years after the spill. When comparing population estimates with 1984-85 data, Klosiewski and Laing (1994) documented decline of six species or species groups.

Burn (1994), using data from the boat surveys, documented declines in sea otter abundance in shoreline habitats of Prince William Sound following the spill. Burn (1994) detected a continuing pattern of significantly lower sea otter densities in oiled coastal areas, suggesting mortality in or displacement of sea otters from these areas.

Agler et al. (1994c, 1995a) and Agler and Kendall (1997) examined whether species shown as injured (Klosiewski and Laing 1994) had recovered. Agler et al. (1995a) found no evidence of recovery for any of the injured species. Inclusion of 1996 survey data (Agler and Kendall 1997) revealed additional information on population trends. Cormorants (***Phalacrocorax*** spp.), bald eagles (***Haliaeetus leucocephalus***), and sea otters exhibited significant trends, indicating that these populations show continued injury from the spill. In addition, the other injured species, loons (***Gavia*** spp.), harlequin ducks (***Histrionicus histrionicus***), black oystercatchers (***Haematopus bachmani***), common murres (***Uria aalge***), pigeon guillemots (***Cepphus columba***), and marbled murrelets (***Brachyramphus marmoratus***), did not show any significant trends (Agler and Kendall 1997) suggesting these populations have not recovered. Additionally, Agler et al. (1995a) and Agler and Kendall (1997) found that some bird populations not designated as injured (ie. goldeneyes, scoters (***Melanitta*** spp.), black-legged kittiwakes (***Rissa tridactyla***), may now be showing trends consistent with injury from an oil spill. The one remaining injured species, Kittlitz's murrelet (***Brachyramphus brevirostris***), exhibited trends consistent with recovery, but since their population was declining in the unoiled zone and slightly increasing in the oiled zone it is questionable if this really indicated recovery (Agler and Kendall 1997).

B. Rationale/Link to Restoration

Restoration of marine bird and sea otter populations requires population estimates to determine whether recovery is occurring or if species are still affected by the oil spill. This project will benefit marine birds and sea otters by revealing species that show continuing injury due to the ***T/V Exxon Valdez*** oil spill. Agler et al. (1994a, 1995a; Agler and Kendall 1997) found additional populations that were not previously shown to be injured (ie. goldeneyes). Survey data from this project have also been used by investigators of other studies on pigeon guillemots (Greg Golet, pers. comm.), marbled murrelets (K. Kuletz, pers. comm.), Kittlitz's murrelets (B. Day, per comm.), harlequin ducks (D. Rosenberg, pers. comm.), sea ducks (D. Rosenberg, pers. comm.), black oystercatchers (B. Andres, pers. comm.), birds and forage fish (W. Ostrand, pers. comm.), herring (E. Brown, pers. comm.), and sea otters (Burn 1994).
Determination of restoration of marine bird populations requires population estimates to monitor whether recovery is occurring or if species are still affected by the oil spill. This project will benefit marine birds by using data collected from 2000 surveys to monitor population trends of species injured by the ***T/V Exxon Valdez*** oil spill.

This project relates to the restoration objectives of several species. The ***Exxon Valdez Oil Spill Restoration Plan*** (***Exxon Valdez*** Oil Spill Trustee Council 1994) lists each species' restoration objectives separately. We only included objectives relating to this project:

> Cormorants - "will have recovered when their populations return to prespill levels in the oil-spill area. An increasing population trend in Prince William Sound will indicate that recovery is underway."
>
> Harlequin duck - "will have recovered when breeding and postbreeding season densities and production of young have returned to estimated pre-spill levels, or when there are no differences in these parameters between oiled and unoiled areas."
>
> Black oystercatchers - "will have recovered when populations attain pre-spill levels"
>
> Marbled murrelet - "will have recovered when populations are stable or increasing."
>
> Pigeon guillemot - "will have recovered when populations are stable or increasing."
>
> Sea otter - "will be considered recovered when population abundance and distribution are comparable to pre-spill abundance and distribution"
>
> Common loons - "will have recovered when their populations return to prespill levels in the oil-spill area. An increasing population trend in Prince William Sound will indicate that recovery is underway."
>
> Kittlitz's murrelet - No recovery objective has been identified at this time.

All of the above recovery objectives relate to determining the population abundance of injured species. This is critical to determining recovery for most species. We propose to use data from a survey of Prince William Sound during March and July 2000 to estimate population abundance and distribution of marine birds. Data will be comparable with pre- and post-spill data collected by the U. S. Fish and Wildlife Service (Dwyer et al. 1976, Irons et al. 1988a,b, Agler et al. 1994c, Klosiewski and Laing 1994, Agler et al. 1995a, Agler and Kendall 1997, Lance et al. 1999) and can be used to examine trends in abundance for these species. There are no other studies currently monitoring the populations of loons, harlequin ducks, pigeon guillemots, marbled murrelets, black osytercqatchers, and cormorants.

Additionally, Klosiewski and Laing (1994) found evidence of oil spill damage for scoters (***Melanitta*** spp.), mew gull (***Larus canus***), arctic tern (***Sterna paradisaea***), and northwestern crow (***Corvus caurinus***). These species have never been added to the list of injured species and do not have restoration objectives. At the present time, this proposed study is the only study continuing to consider these species and track their populations.

Frequent monitoring needs to be conducted to ascertain trends in population abundance within Prince William Sound. We proposed conducting biannual surveys, with the years between surveys used to write reports and publications (Agler 1995). By using data from previous surveys we have conducted power analyses to examine the power to detect trends in population abundance (Taylor and Gerrodette 1993). If all other parameters are equal, power is determined by the number of surveys conducted in a given period of time. As the number of surveys increases the ability to detect a trend increases. For example, if a population had a coefficient of variation (C.V.) of 0.30 (this is higher than that of 73% of the injured species; (Agler and Kendall 1997) the ability to detect an average annual 10 % change in population is 25% with 5 surveys (Fig. 1). By conducting surveys in 2000 the number of surveys increases to 7 and the power to detect same population change increases (Fig. 1). If we continue biannual surveys, when we have completed 10 surveys the power to detect this change would be 90% (Fig. 1). Thus we feel it is important to continue these surveys to enable us to increase the ability to detect population trends. Also, we need to continue to monitor marine bird populations within the Sound in the unlikely event that another environmental perturbation occurs. Few pre-spill data were available before the ***Exxon Valdez*** oil spill, making it extremely difficult to determine what species were injured and to what extent (Klosiewski and Laing 1994).

C. Location

This study will be conducted in Prince William Sound. The study area includes all waters within Prince William Sound, as well as land within 100 m of the shore. Villages within Prince William Sound may be interested in the results of this study, since we will be reporting on the status of several wildlife species that are used for subsistence as well as describing the health of the Prince William Sound ecosystem.

COMMUNITY INVOLVEMENT

Copies of our reports and publications will be available for communities within Prince William Sound and other areas affected by the spill. We have and will continue to use charter boats and crews from the local area.

PROJECT DESIGN

A. Objectives

The purpose of this study is to obtain population estimates of marine birds in Prince William Sound to monitor the recovery of species whose populations may have declined due to the ***T/V Exxon Valdez*** oil spill and to determine whether additional species may still be affected by the oil spill. The specific objectives of this project include:

1. determine distribution and estimate population abundance, with 95% confidence limits, of marine bird populations in Prince William Sound during March and July 2000;

2. determine whether the marine bird species whose populations declined more in oiled areas than in non-oiled areas of Prince William Sound have recovered;

3. determine whether additional species show any oil spill effects;

4. support restoration studies on harlequin duck, black oystercatcher, pigeon guillemot, marbled murrelet, Kittlitz's murrelet, sea ducks, and sea otters by providing data on population changes, distribution, and habitat use of Prince William Sound populations.

B. Methods

1. Study Area

Our study area includes all waters within Prince William Sound and all land within 100 m of shore (Fig. 2). We exclude Orca Inlet, near Cordova, Alaska and the southern sides of Montague, Hinchinbrook, and Hawkins Islands (Klosiewski and Laing 1994).

2. Sampling Methods

Surveys will be conducted in FY00, using methods described in 1998 detailed project description (Agler 1997).

3. Statistical Analyses

As in previous surveys (Klosiewski and Laing 1994, Agler et al. 1994a,b,c, 1995a,b, Agler and Kendall 1997), we will use a ratio estimator (Cochran 1977) to estimate population abundance. Shoreline transects will be treated as a simple random sample; whereas, the coastal-pelagic and pelagic transects will be analyzed as two-stage cluster samples of unequal size (Cochran 1977).

To do this, we will estimate the density of birds counted on the combined transects for a block and multiply by the area of the sampled block to obtain a population estimate for each block. We then will add the estimates from all blocks surveyed and divide by the sum of the areas of all blocks surveyed. We will calculate the population estimate for a stratum by multiplying this estimate by the area of all blocks in the strata. Population estimates for each species and for all birds in Prince William Sound will be calculated by adding the estimates from the three strata, and we will calculate 95% confidence intervals for these estimates from the sum of the variances of each stratum (Klosiewski and Laing 1994).

Population estimates for each species will be combined with other post-oil spill population estimates to determine population trends. We plan to use a homogeneity of slopes test (Freud and Littell 1981) to compare population trends between the oiled and unoiled zones of Prince William Sound to examine whether species with population estimates of >500 individuals have changed over time. To do this, we must assume that marine bird and sea otter populations increase at the same rate in the oiled and unoiled zones of Prince William Sound. The $\log_{10}$ of each population estimate will be calculated after adding 0.5 to the estimate to prevent effects from using log 0. Significantly different slopes would indicate that population abundance of a species or species group changed at different rates. With the homogeneity of slopes test the probability of finding significant trends may be reduced due to annual variation among populations (J. Bart, pers comm.). To reduce the effect of annual variation, we will calculate the ratio of a species' or species group's estimated population in the oiled zone to that in the unoiled zone. We will then use linear regression analyses to determine whether there is a trend among the ratios (Agler and Kendall 1997). For species or species groups showing a significant difference in slopes or ratios, we will determine the rate of change in each zone by linear regression analyses.

To examine population trends from 1989-2000 for the entire Sound, we will calculate linear regressions of the total population estimates of each species and species group.

To map species distribution, densities will be calculated from the number of sightings on transects. For shoreline transects, we will map the density per transect, but for the pelagic and coastal-pelagic strata, we will map the density by block.

5. Statistical Justification for Proposed Monitoring Schedule

Currently, these surveys are scheduled to occur every 2 years over an unspecified time period. This schedule should be considered in light of the results of a power analysis.

To determine optimum survey frequency, we conducted a power analysis to estimate the probability of detecting trends in abundance using linear regression from a given number of samples (Taylor and Gerrodette 1993). We examined our power to detect trends when coefficient of variation (CV) of the population was 0.30 (greater than the mean CV from previous surveys for 73% of the injured species; Fig. 1) and when the CV = 0.13 (the mean summer CV for ***Brachyramphus*** murrelets, an injured species; Fig. 3). Models of seabird population growth predict most species increase no more than 12% per year (Nur and Ainley 1992), so we used 10% for our comparisons.

With CV=0.30 the probability of detecting an average annual change of 10% would be 28% with the 6 surveys completed to date (Fig 1). If we continue on a biannual survey schedule, 1 more survey would be completed by 2002. With 8 surveys the probability of detecting a trend would increase to 71%. If 10 surveys were completed the probability would be 92%. For murrelets the power to detect a 10% change is now 80% (Fig. 3). This would increase to 95% with the completion of the 2000 surveys (Fig. 3).

Based on these calculations, we recommend a monitoring schedule of every two years for these surveys. The years between surveys should be used for report and publication writing.

C. Cooperating Agencies, Contracts and Other Agency Assistance

No contracts or other agency assistance will be required for data analysis and publication of results.

SCHEDULE

A. Measurable Project Tasks for FY 01 (October 1, 2000 - September 30, 2001)

October - November:	Re-write the computer programs for data analysis
March 1:	Prepare draft report of 2000 surveys
March 24-27 :	Attend Annual Restoration Workshop
April 15:	Annual report complete

B. Project Milestones and Endpoints

We will examine the project objectives after each set of surveys and publish a report.

C. Completion Date

Work will be complete when all injured species covered by the surveys have met their restoration objective and are listed as recovered.

PUBLICATIONS AND REPORTS

We plan to complete an annual report.

1.) A draft report will be submitted for peer review on March 1, 2001. The annual report will be completed on April 15, 2001. We estimate 2 months of personnel time provided by ***Exxon Valdez*** Oil Spill Trustee Council (EVOS) to re-write the computer program and 3 months of personnel time provided by ***Exxon Valdez*** Oil Spill Trustee Council (EVOS) to prepare the draft report for review and to incorporate the reviewers' comments to revise the manuscript.

PROFESSIONAL CONFERENCES

We request no funds in FY99 from EVOS for travel to professional conferences..

NORMAL AGENCY MANAGEMENT

This project is not a part of normal agency management for the U. S. Fish and Wildlife Service in Alaska. Although considered an important ecosystem within Alaska, there are no agency funds available to survey Prince William Sound or any other region in Alaska. Although there are few agency funds to pay salaries during the report writing and publication preparation phase of the project, the Office of Nongame Migratory Bird Management is committed to this process and will donate funds needed to ensure publication of the results.

COORDINATION AND INTEGRATION OF RESTORATION EFFORT

This project will provide valuable information on the distribution and habitat use of marine birds and sea otters in Prince William Sound. Principle investigators from other EVOS trustee council funded projects have used our survey data in the past. Data from these surveys would be helpful for the sea otter, harlequin duck, and pigeon guillemot portions of the nearshore vertebrate predator project (\025); the black-legged kittiwake, marbled murrelet, and seabird foraging portions of the Alaska predator ecosystem experiment (\163); Kittlitz's murrelet status and ecology (\142); and harbor seal monitoring (\064).

EXPLANATION OF CHANGES IN CONTINUING PROJECTS

During FY99 we requested $37,000 for writing reports and publications. This year we are requesting $35,700. In FY01 we plan to rewrite the computer data analysis programs, write a report, and revise a manuscript. The computer programs that were used to analyze the data need to completely rewritten, the programs that we were using were developed in 1991 and were not Y2K compliant and now they cannot be used. After the 1998 surveys, we wrote a paper and have submitted it to the Marine Pollution Bulletin. We anticipate that some time will need to be spent revising it in the next fiscal year.

PROPOSED PRINCIPAL INVESTIGATORS

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PERSONNEL

1. Co-Project Leader - Robert M. Suryan, M.S., Wildlife Biologist, GS-11.

Mr. Suryan received a B.S. degree in wildlife management at Humboldt State University (1989), a M.S. degree in marine science at Moss Landing Marine Laboratories (1995), and has 15 years of experience in field biology. He has conducted studies of terrestrial and marine birds and mammals, involving population assessment, habitat use, foraging ecology, diving behavior, and effects of human disturbance. For the past five years, Mr. Suryan has been a co-project leader for APEX component 163E and has conducted studies of the foraging ecology, reproductive biology, and population dynamics of Black-legged Kittiwakes in Prince William Sound, Alaska. He has also worked of the current project for a season.

Mr. Suryan will be responsible for meeting project objectives, tasks and producing the final report.

Selected Reports and Publications

Suryan, R.M., D.B. Irons, and J. Benson. 2000. Prey switching and variable foraging strategies of Black-legged Kittiwakes and the effect on reproductive success. Condor 102:375-385.

Suryan, R.M. and D.B. Irons. In review. Colony and population dynamics of Black-legged Kittiwakes in a heterogeneous environment. Auk.

Suryan, R.M. and D.D. Roby. 1996. Management of Human Impacts. ***In:*** Warheit, K.I., C.S. Harrison, and G.J. Divoky (***eds***.) ***Exxon Valdez*** Oil Spill Seabird Restoration Workshop. ***Exxon Valdez Oil Spill Restoration Final Report, Project 95038***. Technical Publication Number 1. Pacific Seabird Group, Seattle.

Suryan, R.M. and J.T. Harvey. 1998. Tracking harbor seals (***Phoca vitulina richardsi***) to determine dive behavior, foraging activity, and haul-out site use. Mar. Mamm. Sci. 14(2):361-372.

Suryan, R.M. and J.T. Harvey. 1999. Variation in reaction of harbor seals to disturbance. Fish. Bull. 97(2) 332-339.

Ostrand, W.O., G.S. Drew, R.M. Suryan, and L.L. McDonald. 1998. Evaluation of radio-tracking and strip transect methods for determining foraging ranges of Black-legged Kittiwakes. Condor 100:709-718.

2. Co-Project Leader - David B. Irons, Ph.D., Wildlife Biologist, GS-12.

Dr. Irons received his Ph.D from the University of California, Irvine in 1992. His dissertation was on the foraging ecology and breeding biology of the black-legged kittiwake in Prince William Sound. He received his M.S. from Oregon State University in 1982 where he studied foraging behavior of glaucous-winged gulls in relation to the presence of sea otters. Dr. Irons conducted marine birds and sea otter surveys in Prince William Sound in 1984 and 1985. He has been studying kittiwakes in Prince William Sound for 11 years and completed the ***Exxon Valdez*** oil spill kittiwake damage assessment study. Dr. Irons has overseen several seabird studies in the

past few years, including marine bird and sea otter surveys of Prince William Sound and Cook Inlet, a seabird monitoring study on Little Diomede Island, and a cost of reproduction study on kittiwakes.

Selected Seabird Publications:

Irons, D. B. 1998. Foraging area fidelity of individual seabirds in relation to tidal cycles and flock feeding. Ecology 70:647-655.

Irons, D. B. 1992. Factors affecting black-legged kittiwake reproductive success. Unpubl. Ph.D Dissertation. Univ. of California, Irvine.

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Golet, G. H., D. B. Irons, and J.A. Estes. 1999. The cost of chick rearing in black-legged kittiwakes. J. of Animal Ecology.

Hatch, S. A., G. V. Byrd, D. B. Irons, and G. L. Hunt. 1993. Status and ecology of kittiwakes in the North Pacific Ocean. Pages 140-53 ***in*** K. Vermeer, K. T. Briggs, K. H. Morgan, and D. Siegel-Causey, eds. The status, ecology and conservation of marine birds of the North Pacific, Can. Wildl. Serv., Spec. Publ., Ottawa, Canada.

Hogan, M. E., and D. B Irons. 1986. Waterbirds and marine mammals. Pages ***in*** M. J. Hameedi, and D. G. Shaw, eds. Environmental management of Port Valdez, Alaska: scientific basis and practical results. Springer-Verlag, New York.

Vermeer, K., and D. B. Irons. 1991. The glaucous-winged gull on the Pacific Coast of North America. Acta Twentieth Congressus Internationalis Ornithogici:2378-83.

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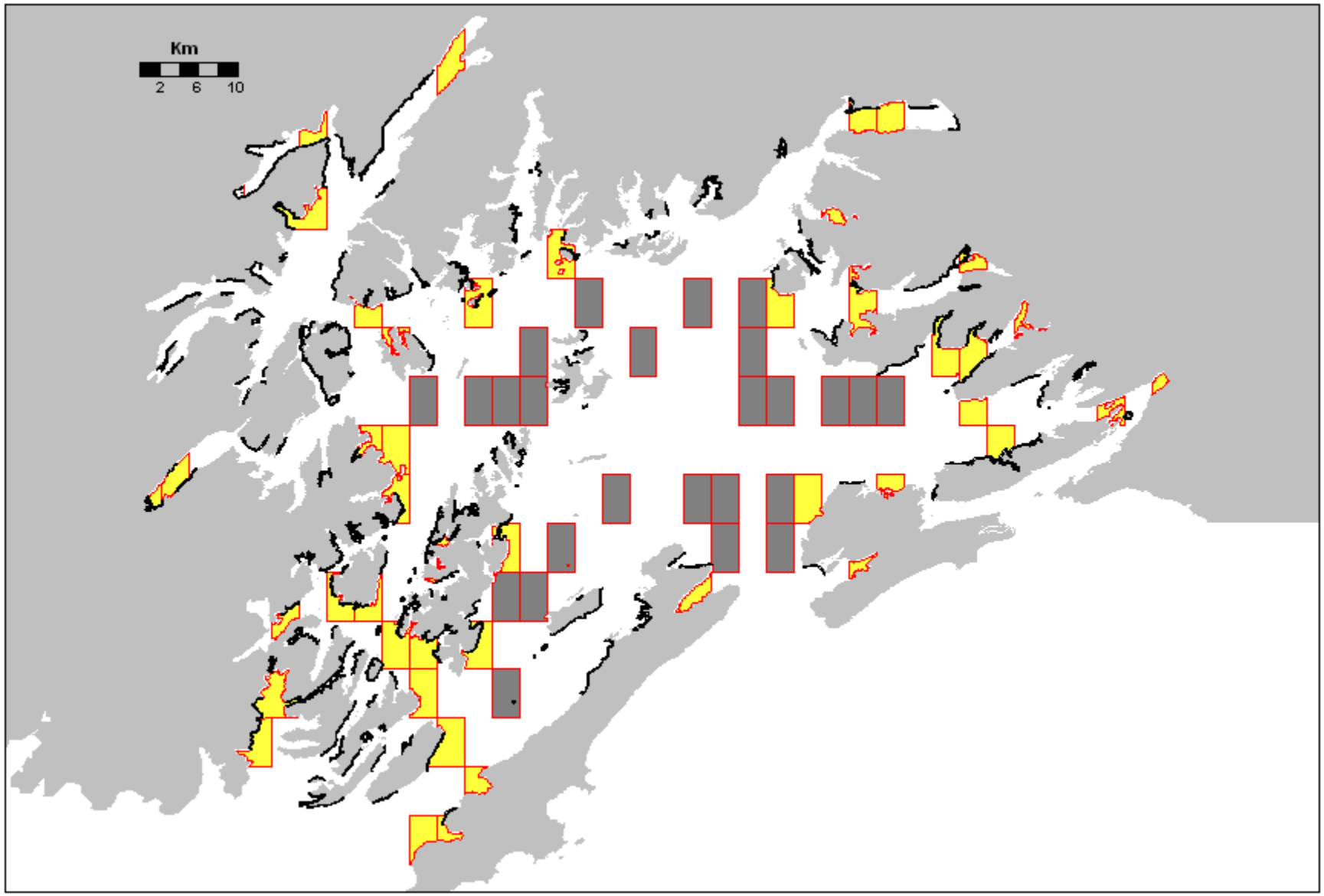

Figure 2. Transects and blocks surveyed during July small boat surveys of Prince William Sound. Transects were classified into 3 strata; the shoreline stratum, (<200 m from land), the coastal-pelagic stratum (lighter shaded blocks), and the pelagic stratum (darker shaded blocks).

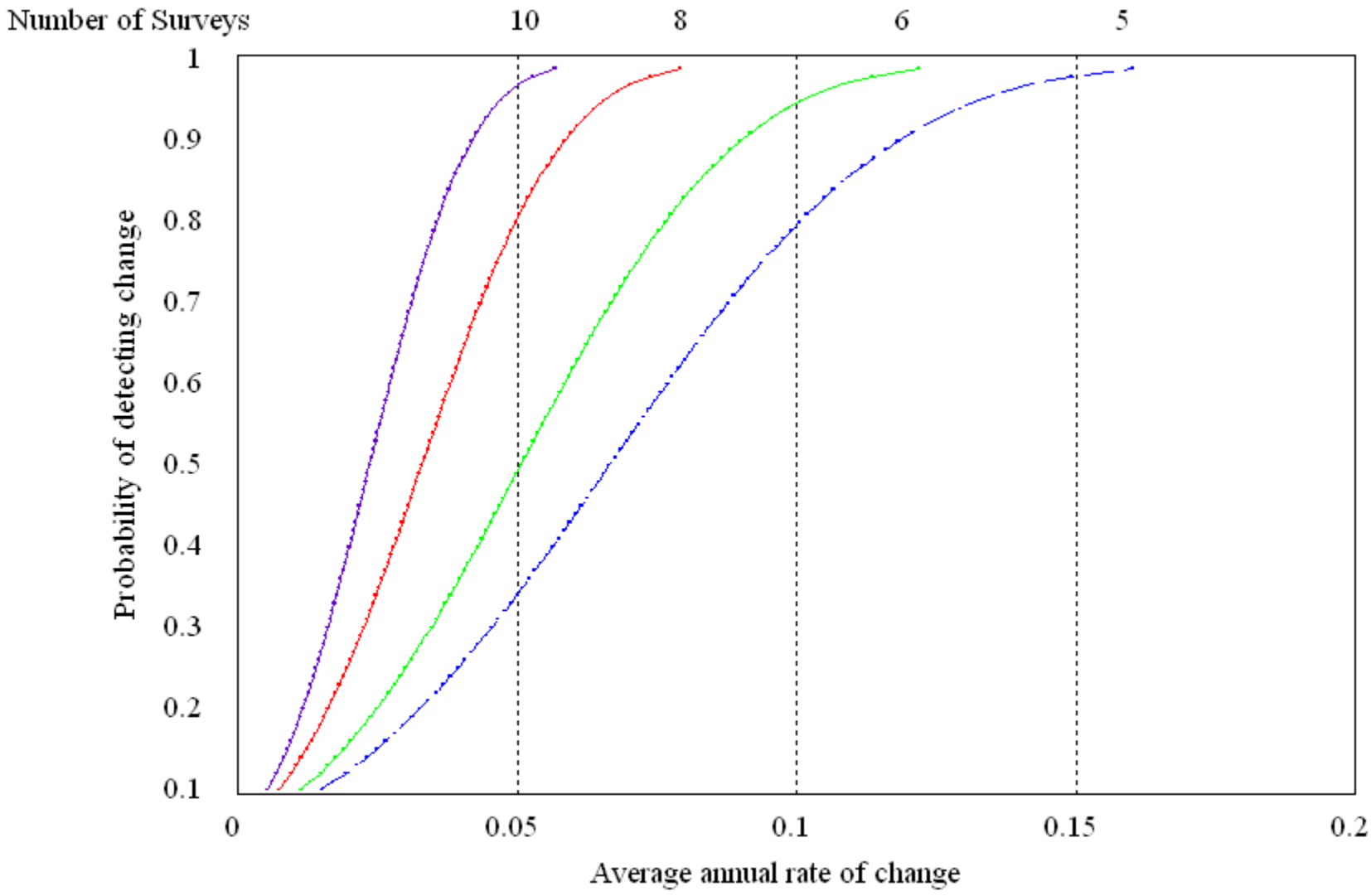

Figure 3. Estimated power (probability of detection) based on numbers of surveys conducted to detect a trend in the July ***Brachyramphus*** murrelet population in Prince William Sound. The CV = 0.13.

2001 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 2000 - September 30, 2001

Budget Category:	Authorized FFY 2000	Proposed FFY 2001
Personnel		$31.0
Travel		$0.0
Contractual		$0.0
Commodities		$0.0
Equipment		$0.0
Subtotal	$0.0	$31.0
General Administration		$4.7
Project Total	$0.0	$35.7
Full-time Equivalents (FTE)		0.4
Other Resources		

LONG RANGE FUNDING REQUIREMENTS

Estimated FY 2002	Estimated FY 2003		
$251.0	$50.0		

Dollar amounts are shown in thousands of dollars.

Comments: Justification of Personnel Costs:

Publications and & Personnel Time

Final Report, 4.5 months (2 months to re-write all data analysis progroms and 2.5 months to analyze data and write report) (EVOS Funded)

Publication: 0.5 months to revise publication that is currently in review (EVOS funded)

We are requesting money to cover Co-PI Suryan only, Co-PI Irons's salary will be paid for by the US Fish and Wildlife Service.

FY 01

Prepared:

Project Number: 01159

Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer; Report and Publication Writing

Agency: DOI - Fish and Wildlife Service

2001 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 2000 - September 30, 2001

Personnel Costs:			GS/Range/	Months	Monthly		
PM	Name	Position Description	Step	Budgeted	Costs	Overtime	
	Suryan	Co-Project Leader	GS11 - 5	5.0	6,200		
	Irons	Co-Project Leader	GS12 - 6	0.0	0		
		Subtotal		5.0	6,200	0	
Those costs associated with program management should be indicated by placement of an *.						**Personnel Total**	

Travel Costs:		Ticket	Round	Total	Daily	
PM	Description	Price	Trips	Days	Per Diem	
Those costs associated with program management should be indicated by placement of an *.					**Travel Total**	

FY 01

Project Number: 01159
Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer; Report and Publication Writing
Agency: DOI - Fish and Wildlife Service

2001 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2000 - September 30, 2001

Contractual Costs:	
Description	
When a non-trustee organization is used, the form 4A is required. **Contractual Total**	
Commodities Costs:	
Description	
Commodities Total	

FY 01

Project Number: 01159
Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer; Report and Publication Writing
Agency: DOI - Fish and Wildlife Service

2001 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET
October 1, 2000 - September 30, 2001

New Equipment Purchases:	Number of Units	Unit Price	
Description			
Those purchases associated with replacement equipment should be indicated by placement of an R.		**New Equipment Total**	

Existing Equipment Usage:	Number of Units	
Description		

FY 01

Project Number: 01159
Project Title: Surveys to Monitor Marine Bird Abundance in Prince William Sound during Winter and Summer; Report and Publication Writing
Agency: DOI - Fish and Wildlife Service